

9th Class 2021		
Biology	Group-II	Paper-I
Time: 1.45 Hours	(Subjective Type)	Marks: 48

(Part-I)

Q.2. Write short answers to any Five (5) questions: (10)

(i) Define tissue and give example.

Ans In multicellular organisms, similar cells (performing similar functions) are organized into groups, called tissues. We can define a tissue as a group of similar cells specialized for the performance of a common function.

There are different types of plant tissues e.g., epidermal tissue, ground tissue, etc.

(ii) Differentiate between morphology and anatomy.

Ans

Morphology	Anatomy
This branch of biology deals with the study of form and structures of living organisms.	This branch of biology deals with the study of internal structures.

(iii) What is population level?

Ans Biologists extend their studies to the population level where they study interactions among member of the same species living in the same habitat. A population is defined as a group of organisms of the same species located at the same place, in the same time.

(iv) Define biological method.

Ans The scientific method in which biological problems are solved, is termed as biological method. It comprises the steps a biologist adopts in order to solve a biological problem.

(v) Differentiate between control group and experimental group.

Ans

Control Group	Experimental Group
Control group is the group in an experiment that does not receive the variable you are testing.	Experimental group is the group that receives the variable being tested in an experiment.

(vi) Define scientific law.

Ans If a theory survives such doubtful approach and continues to be supported by experimental evidence, it becomes a law or principle. A scientific law is a uniform or constant fact of nature. It is an irrefutable theory. Examples of biological laws are Hardy-Weinberg law and Mendel's laws of inheritance.

(vii) Differentiate between cell membrane and plasma membrane.

Ans

Cell membrane	Plasma membrane
All the membranes of a cell are called cell membranes.	Only the outer membrane of a cell is called plasma membrane.

(viii) What is cytoplasm?

Ans Cytoplasm is the semi-viscous and semi-transparent substance between plasma membrane (cell membrane) and nuclear envelope. It contains water in which many organic molecules (proteins, carbohydrates, lipids) and inorganic salts are completely or partially dissolved.

Q.3. Write short answers to any Five (5) questions: (10)

(i) Define taxa. Write name of any two taxa.

Ans The groups into which organisms are classified are known as taxonomic categories or taxa (singular "taxon").

The names of two taxas are as follows:

1. Kingdom
2. Phylum

(ii) Write two characteristics of kingdom fungi.

Ans Following are the two characteristics of kingdom fungi:

1. It includes eukaryotic multicellular heterotrophs which are absorptive in their nutritional mode e.g., mushrooms.
2. Most fungi are decomposers. They live on organic material, secrete digestive enzymes and absorb small organic molecules formed by the digestion by enzymes.

(iii) Define binomial nomenclature.

Ans Binomial nomenclature is the method of giving scientific names to living organisms. As the word "binomial" suggests, the scientific name of a species consists of two names: the first is genus name and the second one is the name of species.

(iv) Define chiasmata.

Ans The two non-sister chromatids of homologous chromosomes in prophase-I join each other at certain points along their length. These points of attachment are called chiasmata.

(v) Write any two significance of mitosis.

Ans The occasions in the lives of organisms where mitosis happens are as follow:

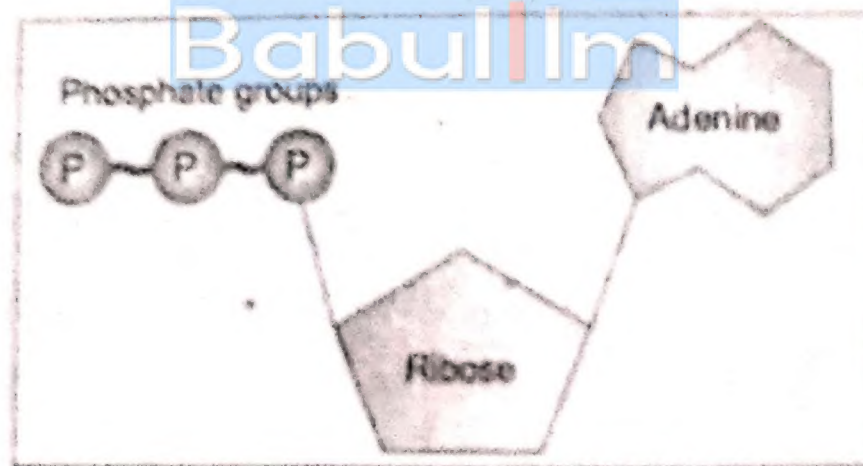
1. Development and growth
2. Cell replacement

(vi) Define bivalent. Why it is called tetrad?

Ans Each pair of homologous chromosomes in Prophase-I of meiosis-I is called bivalent. Each bivalent has four chromatids, so it may also be called a tetrad.

(vii) Sketch molecular structure of ATP.

Ans



Adenosine
Adenosine monophosphate (AMP)
Adenosine diphosphate (ADP)
Adenosine triphosphate (ATP)

Fig. Molecular structure of ATP.

(viii) What products are produced during photosynthesis?

Ans Photosynthesis is the synthesis of glucose from carbon dioxide and water in the presence of sunlight and chlorophyll, with oxygen as a by-product.

Q.4. Write short answers to any Five (5) questions: (10)

(i) What is active site?

Ans Only a small portion of enzyme molecule is directly involved in catalysis. This catalytic region is known as active site. It recognizes and binds substrate and then carries out reaction.

(ii) Define substrate and product.

Ans The molecules at which enzymes act are called substrates, and enzyme converts them into different molecules, called products. All chemical reactions require activation energy. It is defined as minimum energy required to start a reaction. The need for activation energy acts as a barrier to the beginning of reaction.

(iii) Write two characteristics of enzymes.

Ans Two characteristics of enzymes are:

1. Almost all enzymes are proteins i.e., they are made of amino acids.
2. Most enzyme reaction rates are millions of times faster than those of comparable uncatalyzed reactions. As with all catalysts, enzymes are not consumed by the reactions they catalyze.

(iv) What are saturated fatty acids? Give their drawbacks.

Ans Saturated fatty acids:

Saturated fatty acids are the ones that have all of their carbon atoms bonded to hydrogen atoms.

Drawbacks:

Saturated fatty acids can increase a person's cholesterol level. An increased cholesterol level may eventually result in the clogging of arteries and, ultimately, heart disease.

(v) What is chyme?

Ans The starch in our bite of bread and the protein in mutton have been partially digested and the food has been converted to a soup-like mixture called chyme.

(vi) What is the function of root in plants?

Ans Functions of root in plants are given below:

1. Root in plants absorb water and inorganic nutrients.
2. They stores food and nutrients.

(vii) What is mass and size of heart in a normal adult man?

Ans In normal adults, the mass of heart is 250-350 g and the size is equal to a clenched fist.

(viii) What are symptoms of dengue fever?

Ans In dengue fever, there is a sharp decrease in the number of platelets in blood. Because of this, patients bleed from the nose, gums and under the skin.

(Part-II)

Note: Attempt any TWO (2) questions.

Q.5.(a) Define biology and write its major divisions. (4)

Ans Biology is the scientific study of life. The word "biology" has been derived from two Greek words; 'bios' meaning 'life' and 'logos' meaning 'thought or reasoning'.

In the course of biology, we will study how man has thought about living things. To understand and appreciate nature, it is essential to study the structures, functions and related aspects of living organisms. The study of living organisms also provides information and remedies to human problems regarding health, food, environment, etc.

Divisions and Branches of Biology:

There are three major divisions of biology which study the different aspects of the lives of the major groups of organisms:

Zoology:

This division of biology deals with the study of animals.

Botany:

This division of biology deals with the study of plants.

Microbiology:

This division of biology deals with the study of microorganisms such as bacteria etc.

(b) What are plastids? Write its types. (5)

Ans Plastids are also membrane-bound organelles that only occur in the cells of plants and photosynthetic protists (algae). They are of three type *i.e.*, chloroplasts, leucoplasts and chromoplasts.

Like mitochondria, chloroplast is also bound by a double membrane. The outer membrane is smooth while the inner membrane gives rise to sacs called thylakoids. The stack of thylakoids is called granum (plural = grana). Grana float in the inner fluid of chloroplast *i.e.*, stroma. Chloroplasts are the sites of photosynthesis in eukaryotes.

They contain chlorophyll (the green pigment necessary for photosynthesis) and associated pigments. These pigments are present in the thylakoids of grana.

The second type of plastids in plant cells are chromoplasts. They contain pigments associated with bright colors and are present in the cells of flower petals and fruits. Their function is to give colors to these parts and thus help in pollination and dispersal of fruit.

Leucoplasts are the third type of plastids. They are colourless and store starch, proteins and lipids. They are present in the cells of those parts where food is stored.

Q.6.(a) Describe in detail characteristics of kingdom monera and kingdom protista. (4)

Ans **Kingdom Monera:**

It includes prokaryotic organisms *i.e.*, they are made of prokaryotic cells. Monerans are unicellular, although some types form chains, clusters, or colonies of cells. Prokaryotic cells are radically different from eukaryotic cells. Most are heterotrophic but some perform photosynthesis because they have chlorophyll in their cytoplasm. Within this kingdom, there are two different kinds of organisms *i.e.*, bacteria and cyanobacteria.

Kingdom Protista:

It includes eukaryotic unicellular and simple multicellular organisms. There are three main types of protists:

- (i) **Algae** are unicellular, colonial or simple multicellular. They resemble plant cells with cell walls and

chlorophyll in chloroplasts. Simple multicellular means that they do not have multicellular sex organs and do not form embryos during their life cycles.

- (ii) Protozoans resemble animals whose cells lack chlorophyll and cell walls.
- (iii) Some protists are fungi-like.

(b) Describe differences between photosynthesis and respiration. (5)

Ans

Difference between photosynthesis and respiration		
Characteristics	Photosynthesis	Respiration
Metabolism	Anabolism	Catabolism
Energy investment / production	Investment of light energy to store it in the form of bond energy	Bond energy transformed into chemical energy of ATP
Organisms capable of;	Some bacteria, all algae, all plants	All organisms
Site of occurrence	Chloroplasts	In cytoplasm and mitochondria
Time of occurrence	In daytime only, in the presence of light	All the time

Q.7.(a) What is oral cavity? Explain its important functions in the process of digestion. (4)

Ans

Oral cavity - Selection, grinding, partial digestion:

Oral cavity is the space behind mouth and has many important functions in the whole process of digestion. Food selection is one of them. When food enters oral cavity, it is tasted and felt. If the taste of mutton suggests that it is old, we reject it. If teeth or tongue detect some hard object, such as dirt, we also reject that bite. The senses of smell and vision also help oral cavity in the selection of food.

The second function of oral cavity is the grinding of food by teeth. It is known as chewing or mastication. This is useful because oesophagus can pass only small pieces. Enzymes also cannot act on large pieces of food. They require small pieces with large surface areas to attack.

The third and fourth functions of oral cavity are lubrication and chemical digestion of food. The chewing process stimulates the three pairs of salivary glands (under tongue, behind jaws, and in front of ears) to release a juice called saliva in oral cavity. Saliva adds water and mucous to food which act as lubricant to ease the passage of food through oesophagus. Saliva also contains an enzyme salivary amylase, which helps in the semi-digestion of starch.

During the processes of chewing, lubrication and semi-digestion, the pieces of food are rolled up by the tongue into small, slippery, spherical mass called bolus. We swallow bolus and push it in oesophagus through pharynx.

Pharynx and Oesophagus - Swallowing and Peristalsis:

During swallowing, bolus is pushed to the back of mouth by tongue. When tongue pushes bolus, the soft palate also moves upward and to rear. In this way, the opening of nasal cavity is closed. When swallowed, the bolus passes pharynx to enter oesophagus. Pharynx has

adaptations to prevent the entry of bolus particles in trachea (wind pipe to lungs). During swallowing, larynx (the top of trachea) moves upward and forces the epiglottis (a flap of cartilage) into horizontal position. Thus glottis *i.e.*, the opening of trachea is closed. The beginning of swallowing action is voluntary, but once food reaches the back of mouth, swallowing becomes automatic.

After being swallowed, food enters the tube called oesophagus, which connects pharynx to stomach. Neither pharynx nor oesophagus contributes to digestion and the previous digestive actions of saliva continue.

Peristalsis moves food from oral cavity to rectum. Peristalsis is defined as the waves of contraction and relaxation in the smooth muscles of alimentary canal walls.

(b) Draw comparison of veins and capillaries. (5)

Ans

Comparison of capillaries and veins

Characteristics	Capillaries	Veins
Function	Allow the exchange of materials between blood and tissues.	Carry blood towards heart.
Thickness and Elasticity in walls	One-cell thick non-elastic walls	Thin and less elastic
Muscles in walls	No muscles	Thin
Blood pressure	Medium	Low BP
Valves	No valves	Valves present